भारतीय मानक
Indian Standard

IS 6444 : 2023

सल्फर डस्टिंग पाउडर्स — विशिष्टि

(दूसरा पुनरीक्षण)

Sulphur Dusting Powders — Specification

(Second Revision)

ICS 65.100.30

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Pesticides Sectional Committee, FAD 01

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Pesticides Sectional Committee had been approved by the Food and Agriculture Divisional Council.

Sulphur dusting powders are largely used as fungicide and miticide.

Sulphur dusting powder is generally manufactured to contain 85 percent (*m*/*m*) of sulphur.

This standard was first issued in 1972. In the first revision issued in 1979, requirements for the various characteristics were reviewed and verified in the light of experience gained in the country. The modified method for estimating sulphur content and also various stipulations as laid by the Registration Committee of Central Insecticide Board as to the packing and tolerances of this product were incorporated.

In this revision, the standard has been brought out in the latest style and format of the Indian Standards, and references to Indian Standards wherever applicable have been updated.

In the preparation of this standard due consideration has been given to the provisions of the *Insecticides Act*, 1968 and the rules framed thereunder. However, this standard is subject to the restrictions imposed under these, wherever applicable.

The composition of the committee responsible for the formulation of this standard listed in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SULPHUR DUSTING POWDERS — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for sulphur, dusting powders.

2 REFERENCES

The standards listed in Annex A contains provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 REQUIREMENTS

3.1 Description

The material shall be in the form of a fine free flowing powder, yellow to brownish-yellow in colour, free from extraneous impurities and added modifying agents. It may contain fillers, such as, talc and pyrophyllite. The material, when dusted from, a hand rotary duster shall issue freely without clogging the nozzle or bridging.

3.2 The material shall also comply with the requirements specified in Table 1.

3.2.1 *Sulphur Content*

When determined by the method prescribed in Annex B of this standard, the observed sulphur content, percent (*m*/*m*), of any of the samples shall not differ from the declared nominal value by more than the tolerance limits indicated as follows:

Nominal Value, Percent	*Tolerance Limits, Percent*	
Up to 9	+10 -5	of the nominal value
Above 9 and below 50	+5 -5	
50 and above	+5 -3	

4 PACKING

The material shall be packed according to the requirements given in IS 8190 (Part 1).

5 MARKING

5.1 The containers shall bear legibly and indelibly the following information:

a) Name of the material;
b) Name and address of the manufacturer;
c) Batch number;
d) Date of manufacture;
e) Date of expiry;
f) Net quantity;
g) Nominal sulphur content, percent (*m*/*m*)
h) A cautionary notice as worded in the *Insecticide Act*, 1968, and rules framed thereunder; and
j) Any other information required under the *Legal Metrology (Packaged Commodities) Rules*, 2011.

Table 1 Requirements for Sulphur Dusting Powders

(*Clause* 3.2)

Sl No. (1)	**Characteristics** (2)	**Requirement** (3)	**Method of Test, Refer to** (4)
i)	Sulphur content, percent by mas, *Min*	Nominal value as declared on the container (*see* **3.2.1**)	Annex B
ii)	Material passing through 75 micron IS Sieve [*see* IS 460 (Part 1)], percent by mass, *Min*	95.0	IS 6940
iii)	Bulk density after compacting	Not to exceed the value obtained before compacting by more than 45 percent	IS 6940

5.1.1 When packed in bags (*see* **4**) the pictorial marking for ‘USE NO HOOKS. DO NOT PUNCTURE’, as specified in IS 1260 (Part 2) shall be stencilled on the bags.

5.2 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

When freshly manufactured material in bulk quantity is offered for inspection, representative samples of the material shall be drawn and tested as prescribed in IS 10627 within 90 days of its manufacture. When the material is offered for inspection after 90 days of its manufacture, sampling shall be done as prescribed in IS 10627. However, the criteria for conformity of the material when tested, shall he the limits of tolerances, as applicable over the declared nominal value and given under **3.2.1** of the standard.

7 TESTS

7.1 Tests shall be carried out in accordance with the methods referred to in co1 (4) of Table 1.

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — ‘Pure chemicals’ shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A

(*Clause* 2)

LIST OF REFFRRED STANDARDS

IS No.	*Title*
IS 460 (Part 1) : 2020	Test Sieves — Specification: Part 1 Wire cloth test sieves (*fourth revision*)
IS 1070 : 1992	Reagent grade water — Specification (*third revision*)
IS 1260 (Part 2) : 2020	Packaging — Distribution packaging — Graphical symbols for handling and storage of packages: Part 2 General goods (*fourth revision*)
IS 6940 : 1982	Methods of test for pesticides and their formulations (*first revision*)
IS 8190 (Part 1) : 1988	Requirement for packing of pesticides: Part 1 Solid pesticides (*second revision*)
IS 10627 : 1983	Methods for sampling of pesticidal formulations

ANNEX B

[*Clause* 3.2.1 and *Table* 1, *Sl No.* (i)]

DETERMINATION OF SULPHUR CONTENT

B-1 GENERAL

Two methods are prescribed, namely, Method I and Method II. For routine work, Method I is sufficiently accurate. For very accurate determination and in case of dispute, Method II shall be adopted.

B-2 METHOD I

B-2.1 Reagent

B-2.1.1 *Carbon Disulphide*

B-2.2 Procedure

Weigh accurately about 1 g of the dry sample in the fritted glass extraction thimble and extract in the extraction apparatus for at least 15 min with carbon disulphide at the rate of one cycle per minute. Remove the container, dry and weigh. Report the percentage insoluble residue as foreign matter (this includes ash). Report the percentage of sulphur as the difference between 100 and the percentage of foreign matter.

NOTE — Organic impurities may dissolve in carbon disulphide causing slight inaccuracy.

B-2.3 Calculation

Sulphur, percent by mass = $\frac{100-M_1}{M} \times 100$

where

M_1 = mass in g of carbon disulphide insoluble residue; and
M = mass in g of the material taken for the test.

B-3 METHOD II

B-3.1 Principle

The sulphur present in the formulation is converted to thiosulphate using sodium sulphite and the thiosulphate content is determined iodimetrically. If thiosulphate or other sulphur compounds are present a correction shall be made for them since both free and combined sulphur are determined.

B-3.2 Reagents

B-3.2.1 *Sodium Sulphite* - crystals ($Na_2SO_3.7H_2O$)

B-3.2.2 *Liquid Paraffin*

B-3.2.3 *Dilute Formaldehyde* - 40 percent (*v*/*v*)

B-3.2.4 *Acetic Acid* — 20 percent aqueous solution

B-3.2.5 *Standard Iodine Solution* — 0.1 N, freshly prepared

B-3.2.6 *Starch Indicator Solution* — 0.5 percent, freshly prepared

B-3.2.7 *Carbon Tetrachloride*

B-3.3 Procedure

B-3.3.1 Weigh accurately sufficient quantity of the sample to contain 0.1 g of sulphur and transfer it to a conical flask, add 30 ml to 40 ml of water, 2 g of sodium sulphite and liquid paraffin.

B-3.3.2 Attach the condenser, warm gently until the sulphur has dissolved, then boil it for 40 minutes (*see* Note under **B-3.4.1**), cool and remove the condenser. Add 10 ml of formaldehyde, 10 ml of acetic acid and 25 ml of carbon tetrachloride to the solution to, remove the paraffin. Titrate immediately with the standard iodine solution using freshly prepared starch indicator solution.

B-3.3.3 Carry out a blank determination of the reagents using the method given in **B-3.3.1** and **B-3.3.2**.

B-3.4 Calculation

B-3.4.1 Sulphur content, percent by mass =

$$\frac{0.03206\ (V - v)N\ \times 100}{m}$$

where

V = volume in ml of the standard iodine solution required for the test with the material (*see* **B-3.3.2**),

v = volume in ml of the standard iodine solution required for the blank determination (*see* **B-3.3.3**),

N = normality of the standard iodine solution, and

m = mass in g of the sample taken for the test.

NOTE — At the end of this time, all the particles of sulphur shall stand dissolved. If not, continue heating the mixture. If elemental sulphur is present shake the flask, frequently, m order to wash the particles of undissolved sulphur back into the flask.

ANNEX C
(*Foreword*)

COMMITTEE COMPOSITION

Pesticides Sectional Committee, FAD 01

Organization	*Representative*(*s*)
Directorate of Plant Protection Quarantine and Storage, Faridabad	DR RAVI PRAKASH (***Chairperson***)
All India Biotech Association, New Delhi	SHRI SAURABH SINGHAL SHRI SHAH JI DHAR (*Alternate*)
Central Insecticide Board and Registration Committee, Faridabad	SECRETARY DR VANDANA SETH (*Alternate*)
Central Insecticide Laboratory, Faridabad	DR ARCHANA SINHA SHRI SUBHASH CHAUDHARY (*Alternate*)
Consumer Guidance Society of India, Mumbai	SHRI SITARAM DIXIT DR M. S. KAMATH (*Alternate*)
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Ministry of Agriculture, Department of Agriculture, Chennai	JOINT DIRECTOR OF AGRICULTURE (RES) DEPUTY DIRECTOR LAB (*Alternate*)

Organization	*Representative(s)*
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